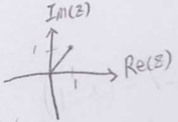
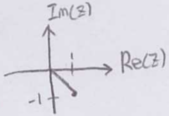
#13

$(1+i) = \sqrt{2}\, e^{i\frac{\pi}{4}}$



Good!

$1-i = \sqrt{2}\, e^{-i\frac{\pi}{4}}$



$\left(\frac{1-i}{1+i}\right)^{100} = \left(\frac{\sqrt{2}\, e^{-i\frac{\pi}{4}}}{\sqrt{2}\, e^{i\frac{\pi}{4}}}\right)^{100} = e^{-i50\pi}$ De moivre 정리에 의해 $e^{-i50\pi} = \cos(-50\pi) + i\sin(-50\pi) = \cos 50\pi - i\sin 50\pi$

$\left(\frac{1+i}{1-i}\right)^{50} = \left(\frac{\sqrt{2}\, e^{i\frac{\pi}{4}}}{\sqrt{2}\, e^{-i\frac{\pi}{4}}}\right)^{100} = e^{i50\pi}$ De moivre 정리에 의해 $e^{i50\pi} = \cos 50\pi + i\sin 50\pi$

$\therefore \left(\frac{1-i}{1+i}\right)^{100} - \left(\frac{1+i}{1-i}\right)^{100} = \cos 50\pi - i\sin 50\pi - \cos 50\pi - i\sin 50\pi$

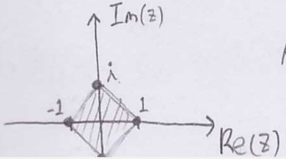
$= -2i\sin 50\pi$

$= 0.$

$\sin 50\pi$
$= \sin(2\pi \times 25 + 0)$
$= \sin 0$

#14.

각 대응점은 $P_1 = i,\ P_2 = i^2 = -1,\ P_3 = i^3 = -i,\ P_4 = i^4 = 1.$



사각형은 한변이 $\sqrt{2}$인 정사각형이므로 사각형의 면적은 2이다.